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L6
     ANSWER 1 OF 3 CAPLUS COPYRIGHT 2004 ACS on STN
AN
     1993:602977 CAPLUS
DN
     119:202977
     Synthesis of perfluoropropane
ΤI
IN
     Webster, James L.; Swearingen, Steven H.; Bruhnke, Douglas W.; Manzer, Leo
     E.; McCann, Elrey L.
PA
     du Pont de Nemours, E. I., and Co., USA
SO
     U.S., 6 pp. Cont. of U.S. Ser. No. 734,016, abandoned.
     CODEN: USXXAM
DT
     Patent
LA
     English
FAN.CNT 1
     PATENT NO.
                    KIND DATE
                                         APPLICATION NO. DATE
     _______
                                          -----
ΡI
     US 5220083 —
                    Α
                           19930615
                                          US 1992-826296
                                                           19920128
PRAI US 1989-452403
                           19891219
     US 1991-734016
                           19910722
OS
     CASREACT 119:202977
AB
     A process carried out in the vapor phase for the prepn. of
     perfluoropropane consisting essentially of reacting propane, propylene and
     partially or totally halogenated C-3 acyclic hydrocarbons with HF and Cl2
     at a temp. of 100-550.degree. in amts. such that the ratio of HF to Cl2 is
     between 1 and 7, in the presence of a solid metal-contg. salt or oxide
     catalyst; and recovering the perfluoropropane is claimed. Thus, propylene
     was treated with excess HF in a tubular reactor over CrOx/Cr203 at
     445.degree. with a contact time of 0.30 s, using a flow of 35 mL/min HF,
     15 mL/min Cl2, and 1.0 mL/min propylene to give 25% F3CF2CF3, 35% C3F7Cl,
     and 41% CF3CCl2CF3, along with 0.4% low mol. wt. degrdn. products.
     Therefore, the yield to F3CF2CF3 and recyclables was 99%.
L6
     ANSWER 2 OF 3 USPATFULL on STN
       2003:153700 USPATFULL
ΑN
TI
       Materials and methods for the production and purification of
       chlorofluorocarbons and hydrofluorocarbons
       Iikubo, Yuichi, West Lafayette, IN, UNITED STATES
IN
       Owens, Stephen, White Pine, TN, UNITED STATES
       Cohn, Mitchel, West Lafayette, IN, UNITED STATES
       Brandstadter, Stephan M., Indianapolis, IN, UNITED STATES
       Hedrick, Vicki E., Brookston, IN, UNITED STATES
       Boggs, Janet K., Brownsburg, IN, UNITED STATES
       Qian, John, West Lafayette, IN, UNITED STATES
       Sacarias, Julie, El Dorado, AR, UNITED STATES
PΤ
       US 2003105368
                        A1
                              20030605
ΑI
       US 2001-966158
                         A1
                              20010928 (9)
       Utility
DТ
      APPLICATION
FS
LREP
      BAKER & DANIELS, 300 NORTH MERIDIAN STREET, SUITE 2700, INDIANAPOLIS,
       IN, 46204-1782
       Number of Claims: 88
CLMN
ECL
       Exemplary Claim: 1
DRWN
       7 Drawing Page(s)
LN.CNT 2001
CAS INDEXING IS AVAILABLE FOR THIS PATENT.
AB
      Methods and materials are provided for the production of essentially
       isomerically pure perhalogenated and partially halogenated compounds.
       One embodiment of the present invention provides a process for the
      production of essentially isomerically pure CFC-216aa. Other embodiments
       include processes for the production of CFC-217ba and HFC-227ea.
      Particular embodiments of the present invention provide separation
       techniques for the separation of chlorofluorocarbons from HF, from other
       chlorofluorocarbons, and the separation of isomers of halogenated
       compounds. Still other embodiments of the present invention provide
      catalytic synthetic techniques that demonstrate extended catalyst
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lifetime. In other embodiments, the present invention provides catalytic techniques for the purification of isomeric mixtures.

## CAS INDEXING IS AVAILABLE FOR THIS PATENT.

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ANSWER 3 OF 3 USPATFULL on STN
L6
AN
       91:60780 USPATFULL
ΤI
       Chromium oxide catalyst composition
       Lerou, Jan J., Chadds Ford, PA, United States
IN
       E. I. Du Pont de Nemours and Company, Wilmington, DE, United States
PA
       (U.S. corporation)
PΙ
       US 5036036 -
                               19910730
       US 1989-365594
                               19890613 (7)
ΑI
DT
       Utility
       Granted
FS
EXNAM Primary Examiner: Shine, W. J.
       Shipley, James E.
LREP
CLMN
       Number of Claims: 5
       Exemplary Claim: 1
ECL
DRWN
       No Drawings
LN.CNT 258
CAS INDEXING IS AVAILABLE FOR THIS PATENT.
       An improved Cr.sub.2 O.sub.3 catalyst composition, prepared by pyrolysis
AB
       of ammonium dichromate, which contains less than 100 ppm of alkali metal
       and is useful in HF hydrofluorination reactions.
```

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

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ANSWER 1 OF 4 CAPLUS COPYRIGHT 2004 ACS on STN
     2003:282507 CAPLUS
DN
     138:289365
TI
     Materials and methods for the production and purification of
     chlorofluorocarbons and hydrofluorocarbons
     Iikubo, Yuichi; Owens, Stephen; Cohn, Mitchel; Brandstadter, Stephan M.;
     Hedrick, Vicki E.; Boggs, Janet K.; Chien, John Chengping; Sacarias, Julie
PA
     Pcbu Services, Inc., USA
SO
     PCT Int. Appl., 66 pp.
     CODEN: PIXXD2
DT
     Patent
LA
     English
FAN.CNT 1
     PATENT NO.
                      KIND DATE
                                           APPLICATION NO. DATE
                     ----
                           _____
PΙ
     WO 2003029173
                      A2
                            20030410
                                           WO 2002-US30729 20020927
                      A3
     WO 2003029173
                            20031030
         W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN,
             CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH,
             GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR,
             LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH,
             PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TN, TR, TT, TZ,
             UA, UG, UZ, VC, VN, YU, ZA, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU,
             TJ, TM
         RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AT, BE, BG,
             CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL,
             PT, SE, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR,
             NE, SN, TD, TG
                                           US 2001-966158
     US 2003105368
                            20030605
                      A1
                                                            20010928
PRAI US 2001-966158
                            20010928
                       Α
     CASREACT 138:289365
     Methods and materials are provided for the prodn. of essentially
AB
     isomerically pure perhalogenated and partially halogenated compds.
     embodiment of the present invention provides a process for the prodn. of
     essentially isomerically pure CFC-216aa. Other embodiments
     include processes for the prodn. of CFC-217ba and HFC-
     227ea. Particular embodiments of the present invention provide
     sepn. techniques for the sepn. of chlorofluorocarbons from HF,
     from other chlorofluorocarbons, and the sepn. of isomers of halogenated
     compds. Still other embodiments of the present invention provide
     catalytic synthetic techniques that demonstrate extended catalyst
     lifetime. In other embodiments, the present invention provides catalytic
     techniques for the purifn. of isomeric mixts.
     ANSWER 2 OF 4 USPATFULL on STN
L12
       2004:9668 USPATFULL
AN
ΤI
       Processes for the purification and use of 2-chloro-1,1,1,2,3,3,3-
       heptafluoropropane and zeotropes thereof with HF
       Miller, Ralph Newton, Newark, DE, United States
IN
       Rao, V. N. Mallikarjuna, Wilmington, DE, United States
       Swearingen, Steven H., Wilmington, DE, United States
PA
       E. I. du Pont de Nemours and Company, Wilmington, DE, United States
       (U.S. corporation)
PΤ
       US 6677493 🛰
                          B1
                               20040113
       US 1999-283449
                               19990401 (9)
AΙ
       US 1998-80709P
                           19980403 (60)
PRAI
       Utility
DT
       GRANTED
EXNAM
       Primary Examiner: Richter, Johann; Assistant Examiner: Price, Elvis O.
       Number of Claims: 19
CLMN
       Exemplary Claim: 1
ECL
       1 Drawing Figure(s); 1 Drawing Page(s)
LN.CNT 610
```

A process is disclosed for the separation of a mixture of HF and CF.sub.3CClFCF.sub.3. The process involves placing the mixture in a separation zone at a temperature of from about -30.degree. C. to about 100.degree. C. and at a pressure sufficient to maintain the mixture in the liquid phase, whereby an organic-enriched phase comprising less than 50 mole percent HF is formed as the bottom layer and an HF-enriched phase comprising more than 90 mole percent HF is formed as the top layer. The organic-enriched phase can be withdrawn from the bottom of the separation zone and subjected to distillation in a distillation column to recover essentially pure CF.sub.3CClFCF.sub.3. The distillate comprising HF and CF.sub.3CClFCF.sub.3 can be removed from the top of the distillation column while essentially pure CF.sub.3CClFCF.sub.3 can be recovered from the bottom of the distillation column. The HF-enriched phase can be withdrawn from the top of the separation zone and subjected to distillation in a distillation column. The distillate comprising HF and CF.sub.3CClFCF.sub.3 can be removed from the top of the distillation column while essentially pure HF can be recovered from the bottom of the distillation column. If desired, the two distillates can be recycled to the separation zone.

Also disclosed are compositions of hydrogen fluoride in combination with an effective amount of CF.sub.3CClFCF.sub.3 to form an azeotrope or azeotrope-like composition with hydrogen fluoride. Included are compositions containing from about 38.4 to 47.9 mole percent CF.sub.3CClFCF.sub.3.

Also disclosed are processes for producing 1,1,1,2,3,3,3-heptafluoro-propane. One process uses a mixture comprising HF and CF.sub.3CClFCF.sub.3 and is characterized by preparing essentially pure CF.sub.3CClFCF.sub.3 as indicated above, and reacting the CF.sub.3CClFCF.sub.3 with hydrogen. Another process uses an azeotropic composition as described above, and reacts the CF.sub.3CClFCF.sub.3 with hydrogen in the presence of HF.

Also disclosed is a process for producing hexafluoropropene. This process is characterized by preparing essentially pure CF.sub.3CClFCF.sub.3 as indicated above, and dehalogenating the CF.sub.3CClFCF.sub.3.

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L12 ANSWER 3 OF 4 USPATFULL on STN
       2001:226805 USPATFULL
AN
ΤI
       Processes for the production of hexafluoropropene and optionally other
       halogenated hydrocarbons containing fluorine
       Sievert, Allen Capron, Elkton, MD, United States
IN
       Rao, V. N. Mallikarjuna, Wilmington, DE, United States
       Walczak, Francis J., New Castle, DE, United States
PA
       E. I. du Pont de Nemours and Company, Wilmington, DE, United States
       (U.S. corporation)
PΙ
       US 6329559
                               20011211
       WO 9962851 19991209
       US 2000-701448
ΑI
                               20001127 (9)
       WO 1999-US12246
                               19990602
                               20001127 PCT 371 date
                               20001127
                                         PCT 102(e) date
PRAI
       US 1998-87751P
                           19980602 (60)
DT
       Utility
FS
       GRANTED
EXNAM
       Primary Examiner: Siegel, Alan
CLMN
       Number of Claims: 20
ECL
       Exemplary Claim: 1
       1 Drawing Figure(s); 1 Drawing Page(s)
DRWN
LN.CNT 961
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CAS INDEXING IS AVAILABLE FOR THIS PATENT.

A process is disclosed for the manufacture of CF.sub.3 CF.dbd.CF.sub.2, and optionally a least one compound selected from CF.sub.3 CH.sub.2 CF.sub.3 and CF.sub.3 CHFCHF.sub.2. The process involves contacting a reactor feed including a precursor stream of at least one halogenated propane of the formula CX.sub.3 CH.sub.2 CH.sub.y X.sub.(3-y) and/or halogenated propene of the formula CX.sub.3 CH.dbd.CH.sub.y X.sub.(2-y), where each X is Cl or F and y is 0, 1 or 2 (provided that the average fluorine content of the precursor stream is no more than 5 fluorine substituents per molecule) with HF and Cl.sub.2 in a chlorofluorination reaction zone containing a fluorination catalyst and operating at a temperature between about 150.degree. C. and 400.degree. C., to produce a reaction zone effluent including HF, HCl and a mixture of reaction products of the precursor feed which contains at least one compound of the formula C.sub.3 Cl.sub.2 F.sub.6 including CClF.sub.2 CClFCF.sub.3 and at least one compound of the formula C.sub.3 HClF.sub.6, including CHF.sub.2 CClFCF.sub.3 and has an average fluorine content which is at least one fluorine substituent per molecule more than the average fluorine content of the precursor stream. The chlorofluorination reaction zone effluent is distilled to produce (i) a low-boiling component including HCl (and when they are present in the reaction zone effluent, C.sub.3 F.sub.8, C.sub.3 ClF.sub.7 and C.sub.3 HF.sub.7), (ii) a hydrogenation feed component containing at least one compo of the formula C.sub.3 Cl.sub.2 F.sub.6 including CClF.sub.2 CClFCF.sub.3 and at least one compound of the formnula C.sub.3 HClF.sub.6 including CHF.sub.2 CClFCF.sub.3, and an underfluorinated component including halogenated propanes containing at least one chlorine subtituent and from one to five fluorine substituents. The CClF.sub.2 CClFCF.sub.3 and CHF.sub.2 CClFCF.sub.3 of hydrogenation feed component (ii) is reacted with hydrogen to produce a mixture including CF.sub.3 CF.dbd.CF.sub.2 and CF.sub.3 CHFCHF.sub.2 and the CF.sub.3 CF.dbd.CF.sub.2 from this product mixture is recovered. Underfluorinated component (iii) is returned to the chlorofluorination reaction zone.

## CAS INDEXING IS AVAILABLE FOR THIS PATENT.

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L12 ANSWER 4 OF 4 USPATFULL on STN
       2000:10072 USPATFULL
AN
TI
       Process for the production of fluorocarbons
IN
       Manogue, William H., Newark, DE, United States
       Nappa, Mario Joseph, Newark, DE, United States
       Sievert, Allen Capron, Elkton, MA, United States
       Rao, V. N. Mallikarjuna, Newark, DE, United States
PA
       E. I. du Pont de Nemours and Company, Wilmington, DE, United States
       (U.S. corporation)
PΙ
       US 6018083
                               20000125
       US 1999-283450
                               19990401 (9)
AΙ
PRAI
       US 1998-80708P
                           19980403 (60)
DT
       Utility
       Granted
FS
EXNAM
       Primary Examiner: Siegel, Alan
       Number of Claims: 3
CLMN
ECL
       Exemplary Claim: 1
DRWN
       1 Drawing Figure(s); 1 Drawing Page(s)
LN.CNT 495
CAS INDEXING IS AVAILABLE FOR THIS PATENT.
       A process is disclosed for the separation of a mixture of HF
AB
       and CF.sub.3 CClFCF.sub.3. The process involves placing the mixture in a
       separation zone at a temperature of from about -30.degree. C. to about
       100.degree. C. and at a pressure sufficient to maintain the mixture in
       the liquid phase, whereby an organic-enriched phase comprising less than
       50 mole percent HF is formed as the bottom layer and an
       HF-enriched phase comprising more than 90 mole percent
```

HF is formed as the top layer. The organic-enriched phase can be withdrawn from the bottom of the separation zone and subjected to distillation in a distillation column to recover essentially pure CF.sub.3 CClFCF.sub.3. The distillate comprising HF and CF.sub.3 CClFCF.sub.3 can be removed from the top of the distillation column while essentially pure CF.sub.3 CClFCF.sub.3 can be recovered from the bottom of the distillation column. The HF-enriched phase can be withdrawn from the top of the separation zone and subjected to distillation in a distillation column. The distillate comprising HF and CF.sub.3 CClFCF.sub.3 can be removed from the top of the distillation column while essentially pure HF can be recovered from the bottom of the distillation column. If desired, the two distillates can be recycled to the separation zone.

Also disclosed are compositions of hydrogen fluoride in combination with an effective amount of CF.sub.3 CClFCF.sub.3 to form an azeotrope or azeotrope-like composition with hydrogen fluoride. Included are compositions containing from about 38.4 to 47.9 mole percent CF.sub.3 CClFCF.sub.3.

Also disclosed are processes for producing 1,1,1,2,3,3,3,-heptafluoropropane. One process uses a mixture comprising HF and CF.sub.3 CClFCF.sub.3 and is characterized by preparing essentially pure CF.sub.3 CClFCF.sub.3 as indicated above, and reacting the CF.sub.3 CClFCF.sub.3 with hydrogen. Another process uses an azeotropic composition as described above, and reacts the CF.sub.3 CClFCF.sub.3 with hydrogen in the presence of HF.

Also disclosed is a process for producing hexafluoropropene. This process is characterized by preparing essentially pure CF.sub.3 CC1FCF.sub.3 as indicated above, and dehalogenating the CF.sub.3 CC1FCF.sub.3.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

## => d his

(FILE 'HOME' ENTERED AT 11:22:31 ON 26 JAN 2004)

```
FILE 'REGISTRY' ENTERED AT 11:22:51 ON 26 JAN 2004
L1
              1 S 2,2-DICHLOROHEXAFLUOROPROPANE/CN
L2
              1 S 2-CHLOROHEPTAFLUOROPROPANE/CN
L3
              1 S 1,1,1,2,3,3,3-HEPTAFLUOROPROPANE/CN
L4
              1 S L3
     FILE 'CAPLUS, USPATFULL' ENTERED AT 11:34:27 ON 26 JAN 2004
L5
             17 S 2,2-DICHLOROHEXAFLUOROPROPANE
L6
              3 S L5 AND 2-CHLOROHEPTAFLUOROPROPANE
L7
             43 S ?216AA
L8
             10 S L7 AND ?217BA
L9
              9 S L8 NOT L6
L10
             9 DUP REM L9 (0 DUPLICATES REMOVED)
L11
             9 S L10 AND HF
L12
             4 S L11 AND ?227EA
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